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Natural
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Montana
Basin Outlook Report
April 1, 1997

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How forecasts are made

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Natural Resources Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

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Natural Resources Conservation Service (formerly the Soil Conservation Service)
Bozeman, Montana

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BASIN SUMMARY OF SNOW COURSE DATA

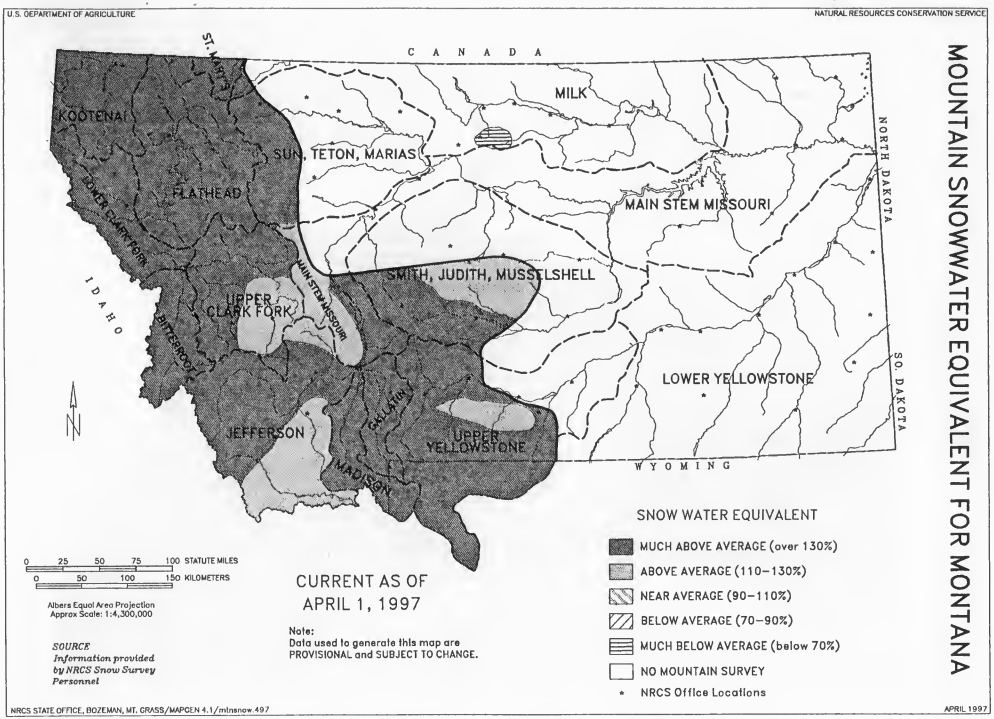
APRIL 1997

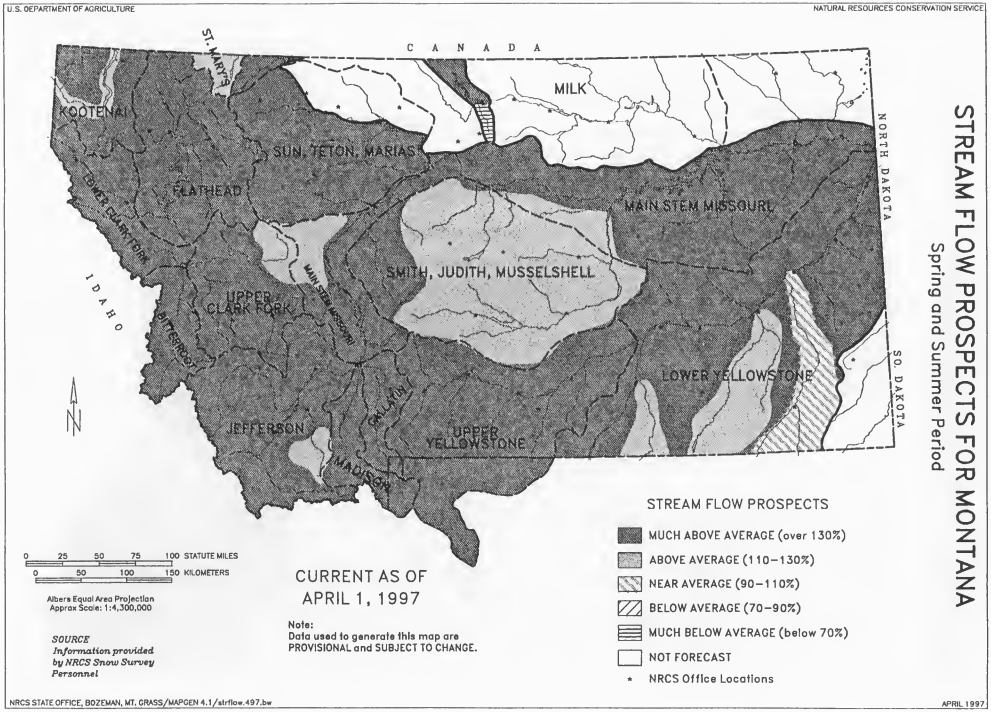
SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
MONTANA						
ABE LINCOLN	4440	3/29/97	75	31.0	18.0	--
ABUNDANCE LAKE	8800	3/26/97	74	28.0	27.0	20.8
ALBRO LAKE PILLOW	8300	4/01/97	---	27.5	--	--
AMBROSE	6480	3/29/97	56	19.7	12.0	13.2
ASHLEY LAKE	4000	4/01/97	32	10.5	6.7	5.8
ARCH FALLS	7350	3/28/97	55	18.0	12.8	12.8
ASHLEY DIVIDE	4820	3/28/97	36	12.3	8.5	6.6
BADGER PASS PILLOW	6900	4/01/97	---	46.3	39.2	36.5
BALD RIDGE	7500	3/26/97	54	19.4	13.8	13.4
BANFIELD MTN PILLOW	5600	4/01/97	---	36.4	21.1	20.2
BAREE CREEK	5500	3/25/97	137	59.9	36.0	45.3
BAREE MIDWAY	4600	3/25/97	123	51.6	23.5	35.1
BAREE TRAIL	3800	3/25/97	47	17.5	6.1	8.4
BARKER LAKES PILLOW	8250	4/01/97	---	18.7	15.3	15.4
BASIN CREEK PILLOW	7180	4/01/97	---	10.4	9.0	8.7
BASSOO PEAK	5150	3/27/97	44	16.5	8.6	11.3
BEAGLE SPGS PILLOW	8850	4/01/97	---	12.3	10.8	8.4
BEAR BASIN	8150	3/25/97	72	26.9	24.0	21.4
BEAVER CREEK PILLOW	7850	4/01/97	---	29.6	20.4	18.3
BERRY MEADOW	7000	4/01/97	32	8.8	8.4	8.0
BIG CREEK	6750	4/02/97	148	59.8	45.8	45.7
BIG SNOWY	7150	3/31/97	62	21.6	17.3	22.4
BISSON CREEK PILLOW	4920	4/01/97	---	19.1	9.1	10.2
BLACK BEAR PILLOW	7950	4/01/97	---	70.0	48.9	38.5
BLACK MOUNTAIN	7750	3/25/97	60	19.7	14.4	16.3
BLACK PINE PILLOW	7100	4/01/97	---	18.0	16.1	12.7
BLACKTAIL	5650	3/29/97	68	27.0	13.6	14.2
BLOODY DICK PILLOW	7550	4/01/97	---	19.7	16.6	12.6
BLUE LAKE	5900	3/30/97	76	30.1	19.3	25.3
BOTS SOTS	7750	3/27/97	36	13.0	12.0	8.2
BOULDER MTN PILLOW	7950	4/01/97	---	27.1	22.6	20.6
BOX CANYON PILLOW	6700	4/01/97	---	15.6	15.1	10.3
BOXELDER CREEK	5100	4/01/97	29	8.2	7.7	8.3
BRACKETT CR PILLOW	7320	4/01/97	---	34.3	25.6	21.2
BRANHAM LAKES	8850	3/24/97	99	41.0	36.9	30.2
BRIDGER BOWL	7250	3/26/97	97	41.4	26.8	26.9
BRISTOW CREEK	3900	3/24/97	48	17.4	7.8	9.4
BRUSH CREEK TIMBER	5000	3/31/97	37	12.3	6.0	9.5
BULL MOUNTAIN	6600	3/26/97	25	9.8	6.9	6.4
CABIN CREEK	5200	3/27/97	28	6.8	7.1	6.2
CALL ROAD	8050	3/27/97	48	14.6	12.5	12.4
CALVERT CR PILLOW	6430	4/01/97	---	16.4	12.1	8.9
CAMP MISERY	6400	4/01/97	---	80.8E	43.0	49.0
CAMP SENIA	7890	3/27/97	32	10.2	9.2	6.6
CARROT BASIN PILLOW	9000	4/01/97	---	41.0	33.5	28.3
CARTER CREEK	7400	4/01/97	34	8.8	4.7	5.9
CEDAR GROVE	3760	3/27/97	63	24.8	7.2	12.2
CHESSMAN RESERVOIR	6200	3/24/97	11	3.3	1.7	3.9
CHICKEN CREEK	4060	3/27/97	72	27.4	16.8	14.0
CLOVER MDW PILLOW	8800	4/01/97	---	21.7	18.5	18.6
COLE CREEK PILLOW	7850	4/01/97	---	16.3	20.8	17.3
COLLEY CREEK	6300	3/31/97	38	12.8	9.5	8.9

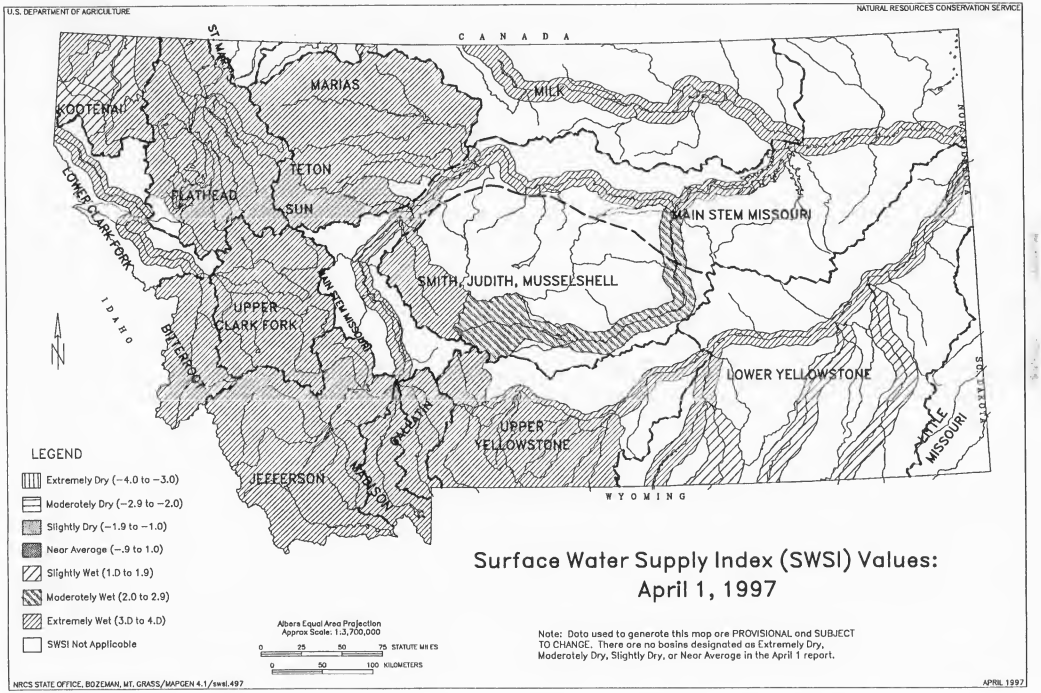
SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
COMBINATION PILLOW	5600	4/01/97	---	7.0	5.4	5.8
COPPER BOTTOM PILLOW	5200	4/01/97	---	19.3	12.0	11.7
COPPER CAMP PILLOW	6950	4/01/97	---	45.0	39.3	34.9
COPPER CREEK	5700	3/31/97	51	19.8	14.8	14.2
COPPER MOUNTAIN	7700	3/28/97	49	17.1	13.2	11.4
COYOTE HILL	4200	3/28/97	51	19.0	8.0	9.5
CREVICE MOUNTAIN	8400	3/30/97	52	15.8	14.1	10.9
CRYSTAL LAKE PILLOW	6050	4/01/97	---	14.7	9.7	12.8
DAD CREEK LAKE	8400	3/27/97	56	17.0	15.8	15.1
DAISY PEAK	7600	3/27/97	42	12.3	10.4	10.6
DAISY PEAK	7600	3/27/97	42	12.3	10.4	10.6
DALY CREEK PILLOW	5780	4/01/97	---	19.0	11.3	11.9
DARKHORSE LK. PILLOW	8700	4/01/97	---	43.6	37.0	33.7
DAVIS CREEK	5400	3/28/97	90	36.5	22.7	24.3
DEADMAN CR PILLOW	6450	4/01/97	---	15.1	10.4	10.2
DEADMAN CREEK	6450	3/26/97	43	14.7	9.9	11.3
DESERT MOUNTAIN	5600	3/30/97	60	23.7	14.8	15.5
DISCOVERY BASIN	7050	3/26/97	49	16.6	12.2	11.3
DIVIDE PILLOW	7800	4/01/97	---	14.6	10.7	11.3
DIX HILL	6400	3/29/97	38	14.0	11.5	11.3
DUPUYER CREEK PILLOW	5750	4/01/97	---	12.4	13.9	12.9
EAGLE CREEK	7000	3/26/97	62	24.6	15.2	14.4
EAST FORK R.S.	5400	3/28/97	29	10.4	4.4	5.6
EL DORADO MINE	7800	4/01/97	80	25.7	23.3	21.6
ELK HORN SPRINGS	7800	3/26/97	41	13.6	12.6	9.3
ELK PEAK	8000	3/27/97	63	22.8	16.2	17.3
EMERY CREEK PILLOW	4350	4/01/97	---	24.7	10.5	16.3
FATTY CREEK	5500	4/02/97	114	44.5	22.1	24.3
FISH CREEK	8000	3/26/97	41	13.3	9.5	9.9
FISHER CREEK PILLOW	9100	4/01/97	---	56.0	46.9	36.1
FIVE-BULL	5700	3/30/97	29	9.8	5.1	6.3
FLATTOP MTN PILLOW	6300	4/01/97	---	65.7	52.7	47.1
FLEECER RIDGE	7500	3/26/97	47	17.5	15.0	11.3
FOOLHEN	8280	3/26/97	66	23.4	20.6	17.1
FOREST LAKE	6400	3/26/97	55	19.5	9.8	12.6
FOUR MILE	6900	3/25/97	36	11.0	8.8	8.9
FOURTH OF JULY	3450	3/29/97	42	14.8	5.5	7.4
FRED BURR PASS	8000	3/26/97	85	32.2	32.2	25.4
FREIGHT CREEK	6000	3/30/97	52	18.8	15.6	15.5
FROHNER MDWS PILLOW	6480	4/01/97	---	9.6	8.8	8.7
GARVER CREEK PILLOW	4250	4/01/97	---	18.3	11.3	10.1
GARVER CREEK	4250	3/28/97	53	19.2	13.1	10.2
GIBBONS PASS	7100	3/28/97	91	32.0	30.2	23.2
GOAT MOUNTAIN	7000	3/28/97	46	14.3	10.6	10.5
GOLD CREEK LAKE	7200	4/01/97	63	20.1	16.0	15.9
GOLD STONE	8100	3/26/97	62	22.6	23.6	17.4
GRASSHOPPER	7000	3/27/97	31	9.3	5.2	6.2
GRAVE CRK PILLOW	4300	4/01/97	---	24.9	15.4	16.7
GRIFFIN CR DIVIDE	5150	3/27/97	48	17.2	8.5	11.2
GUNSIGHT LAKE	6300	3/30/97	127	52.4	47.8	40.0
HAND CREEK PILLOW	5030	4/01/97	---	20.5	12.1	13.3
HAWKINS LAKE PILLOW	6450	4/01/97	---	33.8	27.6	29.0
HAYMAKER	8050	3/25/97	49	15.2	12.6	12.7
HEART LAKE TRAIL	4800	3/26/97	90	33.6	16.6	21.6
HEBGEN DAM	6550	3/27/97	44	15.7	12.1	12.1
HELL ROARING DIVIDE	5770	3/27/97	107	40.2	30.9	31.0
HERRIG JUNCTION	4850	3/27/97	98	39.2	28.9	26.0
HOLBROOK	4530	3/28/97	50	17.0	9.0	9.0
HOODOO BASIN	6050	3/26/97	172	69.5	50.7	51.0

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
HOODOO BASIN PILLOW	6050	4/01/97	---	70.8	52.0	47.0
HOODOO CREEK	5900	3/26/97	166	66.4	44.0	46.3
INDEPENDENCE	7850	3/28/97	67	24.5	22.2	18.3
INTERGAARD	6450	3/26/97	36	12.1	6.7	8.6
JAHNKE LAKE TRAIL	7200	3/26/97	41	13.9	13.8	10.0
JOHNSON PARK	6450	3/27/97	24	7.2	5.6	6.9
KEELER CREEK	3300	3/26/97	74	30.4	8.0	10.8
KINGS HILL	7500	3/26/97	51	16.4	14.2	14.5
KISHENEHN	3890	3/28/97	46	14.3	7.9	7.0
KIWANIS CAMP	3720	4/01/97	0	.0	.8	.8
KRAFT CREEK PILLOW	4750	4/01/97	---	28.7	14.1	15.3
LAKE CREEK	6100	3/27/97	32	9.8	8.4	8.5
LAKEVIEW CANYON	6930	3/31/97	38	12.2	9.7	12.3
LAKEVIEW RDG. PILLOW	7400	4/01/97	---	13.7	12.3	13.0
LEMHI RIDGE PILLOW	8100	4/01/97	---	14.5	13.1	11.1
LICK CREEK PILLOW	6860	4/01/97	---	16.5	10.2	14.4
LITTLE PARK	7400	3/26/97	63	23.0	18.0	16.3
LOGAN CREEK	4300	3/31/97	51	10.7	8.2	7.1
LONE MOUNTAIN PILLOW	8880	4/01/97	---	27.9	24.2	19.2
LOST HORSE	5940	3/27/97	113	43.1	28.8	32.3
LOST SOUL	4800	3/24/97	61	23.4	15.2	15.3
LOWER TWIN PILLOW	7900	4/01/97	---	24.4	21.3	18.6
LUBRECHT PILLOW	4680	4/01/97	---	7.7	4.3	5.1
LUBRECHT FOREST NO 3	5450	3/28/97	33	10.4	5.8	6.8
LUBRECHT FOREST NO 4	4650	3/28/97	13	4.1	1.2	2.1
LUBRECHT FOREST NO 6	4040	3/28/97	18	6.3	1.8	2.3
LUBRECHT HYDROPLOT	4200	3/31/97	24	8.5	4.3	4.2
MADISON PLT PILLOW	7750	4/01/97	---	42.0	29.0	24.8
MANY GLACIER PILLOW	4900	4/01/97	---	23.7	14.0	16.6
MARIAS PASS	5250	3/27/97	68	30.0	17.1	17.4
MAYNARD CREEK	6210	3/26/97	62	23.8	10.8	15.1
MIDDLE MILL CREEK	7850	3/24/97	54	20.6	18.9	16.6
MILL CREEK	7500	3/31/97	53	20.0	14.9	13.7
MINERAL CREEK	4000	3/27/97	79	30.6	17.6	17.5
MONUMENT PK PILLOW	8850	4/01/97	---	33.2	26.4	21.4
MOSS PEAK PILLOW	6780	4/01/97	---	64.1	43.5	38.4
MT LOCKHART PILLOW	6400	4/01/97	---	29.7	26.0	21.5
MUDD LAKE	7650	3/26/97	73	28.3	28.1	20.0
MULE CREEK PILLOW	8300	4/01/97	---	22.8	22.0	16.2
NEVADA CREEK PILLOW	6480	4/01/97	---	21.2	16.8	13.4
NEVADA RIDGE PILLOW	7020	4/01/97	---	20.4	19.7	15.3
NEW WORLD	6900	3/26/97	54	21.6	13.2	15.7
NEWTON MOUNTAIN	5600	3/29/97	114	48.1	32.9	35.6
NEZ PERCE CMP PILLOW	5650	4/01/97	---	23.7	17.1	15.1
NEZ PERCE CREEK	6600	3/28/97	33	11.0	7.2	7.1
NEZ PERCE PASS	6570	3/28/97	68	23.6	15.6	17.1
NOISY BASIN PILLOW	6040	4/01/97	---	71.1E	41.1	40.7
N.F. ELK CR PILLOW	6250	4/01/97	---	17.8	14.0	13.2
NF JOCKO PILLOW	6330	4/01/97	---	67.6	49.4	46.7
N.E. ENTRANCE PILLOW	7350	4/01/97	---	12.1	12.8	9.2
NOTCH	8500	3/27/97	61	18.3	16.2	16.4
OPHIR PARK	7150	3/29/97	58	21.4	17.8	18.0
PALISADE CREEK	8250	4/01/97	102	42.3	41.1	29.9
PETERSON MEADOWS	7200	3/27/97	48	13.4	9.3	10.8
PICKET PIN LOWER	6200	3/26/97	9	2.8	3.0	3.0
PICKET PIN MIDDLE	7250	3/27/97	33	12.6	13.1	13.4
PICKET PIN UPPER	8100	3/27/97	68	24.8	23.6	20.9
PICKFOOT CRK PILLOW	6650	4/01/97	---	15.4	12.3	11.0
PIKE CREEK PILLOW	5930	4/01/97	---	42.2	30.7	27.9

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
PIPESTONE PASS	7200	3/26/97	24	8.0	5.4	5.9
PLACER BASIN PILLOW	8830	4/01/97	---	24.8	22.1	19.1
POORMAN CREEK	5100	3/27/97	110	43.9	23.2	34.4
PORCUPINE PILLOW	6500	4/01/97	---	12.0	8.0	7.4
POTOMAGETON PARK	7150	3/31/97	50	19.3	14.4	14.6
RED MOUNTAIN	6000	3/27/97	68	28.6	22.1	18.9
RED TOP	5260	3/29/97	98	41.3	29.9	29.0
REVAIS CREEK	4800	3/27/97	10	3.1	.6	2.1
ROCK CREEK	5600	3/31/97	28	9.0	6.6	10.6
ROCK CREEK MEADOW	8160	3/31/97	82	31.2	26.0	22.0
ROCKER PEAK PILLOW	8000	4/01/97	---	18.0	16.2	15.3
ROCKY BOY PILLOW	4700	4/01/97	---	2.7	1.5	4.9
ROCKY BOY	4700	4/01/97	4	.9	1.3	4.4
SACAJAWEA	6550	3/26/97	59	24.3	14.3	14.6
SADDLE MTN PILLOW	7900	4/01/97	---	39.2	35.5	26.1
SHORT CREEK PILLOW	7000	4/01/97	---	7.2	5.9	6.3
SHOWER FALLS PILLOW	8100	4/01/97	---	31.7	25.3	23.8
SILVER RUN PILLOW	6630	4/01/97	---	5.7	6.8	6.8
SKALKAHO PILLOW	7260	4/01/97	---	39.5	32.1	24.9
SLAG-A-MELT LAKE	8750	3/26/97	93	38.6	25.8	25.8
SLIDE ROCK MOUNTAIN	7100	3/30/97	59	19.9	15.0	16.7
SMUGGLER MINE	6960	3/24/97	38	12.3	9.3	10.5
S.F. SHIELDS PILLOW	8100	4/01/97	---	30.0	20.1	17.9
SPOTTED BEAR MTN.	7000	3/30/97	59	22.4	15.7	14.9
SPUR PARK PILLOW	8100	4/01/97	---	27.8	24.1	22.2
SQUAW PEAK PILLOW	6150	4/01/97	---	29.7	16.7	15.6
STAHL PEAK PILLOW	6030	4/01/97	---	49.2	47.2	35.1
STEMPLE PASS	6600	3/25/97	44	13.8	8.2	10.6
STORM LAKE	7780	3/27/97	57	18.0	12.8	14.0
STRYKER BASIN	6180	3/27/97	113	44.5	38.1	34.6
STUART MOUNTAIN	7400	4/02/97	125	50.9	43.1	32.9
STUART MOUNTAIN PILL	7400	4/01/97	---	47.8	34.5	30.9
SUCKER CREEK	3960	4/01/97	0	.0	.7	.4
TAYLOR ROAD	4080	4/01/97	2	.2	.9	2.2
TEN MILE LOWER	6600	3/24/97	30	8.7	5.7	7.8
TEN MILE MIDDLE	6800	3/24/97	46	13.8	11.5	12.2
TEPEE CREEK PILLOW	8000	4/01/97	---	18.8	13.9	13.4
TIMBERLINE CREEK	8850	3/27/97	67	23.3	19.7	14.8
TIZER BASIN PILLOW	6840	4/01/97	---	11.8	10.7	12.0
TRAIL CREEK	7090	3/27/97	28	8.8	8.7	8.7
TRINKUS LAKE	6100	3/30/97	164	67.5	40.8	43.4
TRUMAN CREEK	4060	3/30/97	27	9.0	4.8	3.5
TV MOUNTAIN	6800	4/02/97	82	29.6	20.4	19.2
TWELVEMILE PILLOW	5600	4/01/97	---	31.9	14.3	18.6
TWENTY-ONE MILE	7150	3/27/97	65	24.2	18.6	17.4
TWIN CREEKS	3580	3/30/97	54	21.3	9.6	10.3
TWIN LAKES PILLOW	6400	4/01/97	---	65.9	43.0	40.4
UPPER HOLLAND LAKE	6200	3/30/97	128	53.0	34.5	35.4
WALDRON PILLOW	5600	4/01/97	---	17.4	14.4	11.3
WARM SPRINGS PILLOW	7800	4/01/97	---	31.2	29.9	22.3
WEASEL DIVIDE	5450	4/01/97	---	47.2E	35.9	33.8
WEST YELLOWSTONE	6700	3/25/97	50	17.3	10.5	11.6
WHISKEY CREEK PILLOW	6800	4/01/97	---	25.6	19.0	17.5
WHITE MILL PILLOW	8700	4/01/97	---	38.4	36.1	25.1
WHITE PINE RIDGE	8850	3/27/97	27	6.8	4.4	5.8
WILLOW CREEK	6500	3/28/97	33	9.8	9.4	9.5
WOOD CREEK PILLOW	5960	4/01/97	---	15.7	10.6	12.2
WRONG CREEK	5700	3/26/97	54	19.7	13.7	13.6
WRONG RIDGE	6800	3/26/97	67	25.7	20.2	19.4


U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
MOUNTAIN SNOWWATER EQUIVALENT FOR MONTANA
C A N A D A
ST. MARY'S
KOOTENAI
SUN, TETON, MARIAS
MILK
NORTH DAKOTA
FLATHEAD
MAIN STEM MISSOURI
LOWER CLARK FORK
I D A H O
BITTERROOT
MUINSTEM MISSOURI
SMITH, JUDITH, MUSSELSHELL
UPPER CLARK FORK
LOWER YELLOWSTONE
SO. DAKOTA
GALLATIN
JEFFERSON
UPPER YELLOWSTONE
MADISON
W Y O M I N G
N
0 25 50 75 100 STATUTE MILES
0 50 100 150 KILOMETERS
Albers Equal Area Projection
Approx Scale: 1:4,300,000
SOURCE
Information provided by NRCS Snow Survey Personnel
CURRENT AS OF APRIL 1, 1997
Note:
Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.
SNOW WATER EQUIVALENT
MUCH ABOVE AVERAGE (over 130%)
ABOVE AVERAGE (110–130%)
NEAR AVERAGE (90–110%)
BELOW AVERAGE (70–90%)
MUCH BELOW AVERAGE (below 70%)
NO MOUNTAIN SURVEY
NRCS Office Locations
NRCS STATE OFFICE, BOZEMAN, MT. GRASS/MAPGEN 4.1/mtsnow497
APRIL 1997


U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
STREAM FLOW PROSPECTS FOR MONTANA
Spring and Summer Period
CANADA
ST. MARY'S
MILK
KOOTENAI
SUN, TETON, MARIAS
FLATHEAD
NORTH DAKOTA
MAIN STEM MISSOURI
BOWEN, QUARTZ CREEK
SMITH, JUDITH, MUSSELSHELL
IDAHO
UPPER CLARK FORK
MAIN STEM MISSOURI
BITTERROOT
LOWER YELLOWSTONE
SO. DAKOTA
N
JEFFERSON
BIG HOLE
UPPER YELLOWSTONE
MADISON
0 25 50 75 100 STATUTE MILES
0 50 100 150 KILOMETERS
Albers Equal Area Projection
Approx Scale: 1:4,300,000
SOURCE
Information provided by NRCS Snow Survey Personnel
CURRENT AS OF APRIL 1, 1997
Note:
Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.
STREAM FLOW PROSPECTS
MUCH ABOVE AVERAGE (over 130%)
ABOVE AVERAGE (110–130%)
NEAR AVERAGE (90–110%)
BELOW AVERAGE (70–90%)
MUCH BELOW AVERAGE (below 70%)
NOT FORECAST
NRCS Office Locations
NRCS STATE OFFICE, BOZEMAN, MT. GRASS/MAPGEN 4.1/strflow.497.bw
APRIL 1997


U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
CANADA
ST. MARY
MARIAS
MILK
KOOTENAI
TETON
LOWER CLARK FORK
FLATHEAD
SUN
MAIN STEM MISSOURI
SMITH, JUDITH, MUSSELSHELL
IDAHO
UPPER CLARK FORK
MAIN STEM MISSOURI
BITTERROOT
LOWER YELLOWSTONE
JUDITH
UPPER YELLOWSTONE
MUSSELSHELL
MISSOURI
JEFFERSON
MADISON
WYOMING
LEGEND
Extremely Dry (−4.0 to −3.0)
Moderately Dry (−2.9 to −2.0)
Slightly Dry (−1.9 to −1.0)
Near Average (−.9 to 1.0)
Slightly Wet (1.0 to 1.9)
Moderately Wet (2.0 to 2.9)
Extremely Wet (3.0 to 4.0)
SWSI Not Applicable
Albers Equal Area Projection
Approx Scale: 1:3,700,000
0 25 50 75 STATUTE MILES
0 50 100 KILOMETERS
Surface Water Supply Index (SWSI) Values:
April 1, 1997
Note: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE. There are no basins designated as Extremely Dry, Moderately Dry, Slightly Dry, or Near Average in the April 1 report.
NRCS STATE OFFICE, BOZEMAN, MT. GRASS/MAPGEN 4.1/swsi.497
APRIL 1997

Montana Water Supply Outlook Report as of April 1, 1996

March had varied temperatures and mainly scattered storms. For the most part, temperatures were in the forties and fifties during the day and in the twenties and thirties for lows. There were a couple times when valley temperatures were ten to twenty degrees above average. During the warm spells, valley snow melted slowly and low to mid elevation snowpacks began warming up. There was some valley flooding reported, but for the most part the valley snowpack come off slow.

Snowpack

Storms that brought snow to the mountains and valleys across the state were highly variable. Some areas added several inches during storms while others received very little. Overall, March did not add significant snow to the already well above to record mountain snowpacks already in place. By this time of year, about 95 percent of our winter snowpack should be in place. It is the point in time where the snowpack should begin warming, and begin melting. This years spring temperatures and rain will be monitored closer than normal in anticipation of high snowmelt peak runoff from the well above average snowpacks in most mountainous areas of the state.

As of April 1, mountain snow water content was 44 percent above average and 37 percent above last year. West of the Continental Divide, snow water content was 49 percent above average and 49 percent above last year. East of the Continental Divide, snow water content was 35 percent above average and 19 percent above last year.

The Madison River Basin has tied 1974 and the Gallatin and Upper Yellowstone River Basins have tied 1971 for the April 1 record snow water content, for the period, 1961-1996. Most other major river basins are within the top five years of record.

With about 95 percent of the winter snowpack in place, most areas should have average to well above average spring and summer water supply. This year, most streams are expected to have above to well above streamflows and depending upon the spring weather, many streamflow peaks may be near or above maximums of record.

RIVER BASIN	% OF AVERAGE	% OF LAST YEAR
COLUMBIA	149	149
KOOTENAI	150	163
FLATHEAD	154	150
UPPER CLARK FORK	138	129
BITTERROOT	153	144
LOWER CLARK FORK	149	170
MISSOURI	136	128
MISSOURI HEADWATERS	140	125
JEFFERSON	136	118
MADISON	146	129
GALLATIN	145	137
MISSOURI MAINSTEM	126	130
HEADWATERS MAINSTEM	123	121
SMITH-JUDITH-MUSSELSHELL	126	134
SUN-TETON-MARIAS	135	131
MILK (BEARPAW MTNS.)	57	93
ST. MARY	148	142
ST. MARY and MILK	129	136
YELLOWSTONE	136	112
UPPER YELLOWSTONE	147	117
LOWER YELLOWSTONE (WYOMING)	126	105
WIND	133	109
SHOSHONE	152	101
BIGHORN	131	104
TONGUE	112	99
POWDER	116	108

Precipitation

March mountain and valley precipitation, across the state, was 24 percent above average and 43 percent above last year, while water year precipitation was 42 percent above average and 11 percent above last year.

West of the Continental Divide, March mountain and valley precipitation was 59 percent above average and 141 percent above last year and water year precipitation was 46 percent above average and 8 percent above last year. East of the Continental Divide, March mountain and valley precipitation was 1 percent above average and the same as last year and water year precipitation was 39 percent above average and 13 percent above last year.

Combined mountain and valley precipitation are as follows:

RIVER BASIN	APRIL % OF AVERAGE	WATER YEAR % OF AVERAGE
COLUMBIA	159	146
KOOTENAI	198	147
FLATHEAD	163	151
UPPER CLARK FORK	124	129
BITTERROOT	176	152
LOWER CLARK FORK	171	142
MISSOURI	98	134
JEFFERSON	97	138
MADISON	93	147
GALLATIN	95	145
MISSOURI MAINSTEM	83	116
SMITH-JUDITH-MUSSELSHELL	98	123
SUN-TETON-MARIAS	134	129
MILK	78	95
ST. MARY	147	139
YELLOWSTONE	96	139
UPPER YELLOWSTONE	102	152
LOWER YELLOWSTONE	93	128
WIND	96	130
SHOSHONE	93	154
BIGHORN	85	114
TONGUE	106	115
POWDER	82	

Reservoirs

Major reservoir storage across the state was 7 percent above average and 2 percent below last year.

West of the Continental Divide, reservoirs were 14 percent above average and 5 percent above last year. East of the Continental Divide, reservoirs were 1 percent above average and 9 percent below last year.

Keep in mind, reservoirs are being managed in anticipation of the high spring runoff from well above average snowpack. Questions concerning reservoir operations should be directed to the reservoir owners.

RIVER BASIN	% OF AVERAGE	% OF LAST YEAR
COLUMBIA	114	105
KOOTENAI	154	138
FLATHEAD	83	77
UPPER CLARK FORK	103	83
BITTERROOT	98	61
LOWER CLARK FORK	131	136
MISSOURI	99	89

Reservoirs (continued)

RIVER BASIN	% OF AVERAGE	% OF LAST YEAR
JEFFERSON	105	95
MADISON	94	92
GALLATIN	176	120
MISSOURI MAINSTEM	83	87
SMITH-JUDITH-MUSSELSHELL	107	78
SUN-TETON-MARIAS	126	88
MILK	131	110
ST. MARY	139	88
YELLOWSTONE	94	96
UPPER YELLOWSTONE	98	99
LOWER YELLOWSTONE	94	96

Streamflow

Streamflow forecasts across Montana were 42 percent above average and 29 percent above last years forecasts. If the forecasts occur, there will be several new volume flow records and several others that will be second highest of record.

West of the Continental Divide, streamflows are forecast to be 43 percent above average and 32 percent above last years forecasts. East of the Continental Divide, streamflows are forecast to be 41 percent above average and 26 percent above last years forecasts.

RIVER BASIN	FORECASTS % OF AVERAGE	FORECASTS % OF LAST YEAR
COLUMBIA	143	132
KOOTENAI	122	105
FLATHEAD	142	125
UPPER CLARK FORK	150	162
BITTERROOT	148	127
LOWER CLARK FORK	154	141
MISSOURI	147	131
JEFFERSON	156	132
MADISON	146	129
GALLATIN	149	137
MISSOURI MAINSTEM	159	135
SMITH-JUDITH-MUSSELSHELL	133	127
SUN-TETON-MARIAS	138	124
MILK	133	129
ST. MARY	128	120
YELLOWSTONE	156	122
UPPER YELLOWSTONE	153	125
LOWER YELLOWSTONE	158	120

*NOTE: The **FORECAST AS % OF LAST YEAR** column above, is this years forecast as a percent of last years forecast, not of what actually occurred.*

Surface Water Supply Index

The Surface Water Supply Index (SWSI) is an indicator of surface water supply conditions for the spring and summer months. Water users that rely on mountain precipitation can use the index to evaluate seasonal surface water supplies. The SWSI accounts for mountain snowpack, mountain precipitation, streamflow, reservoir storage, and soil moisture.

SWSI RATING	SURFACE WATER CONDITION
+3.0 to +4.0	Extremely Wet
+2.0 to +3.0	Moderately Wet
+1.0 to +2.0	Slightly Wet
-1.0 to +1.0	Near Average
-1.0 to -2.0	Slightly Dry
-2.0 to -3.0	Moderately Dry
-3.0 to -4.0	Extremely Dry

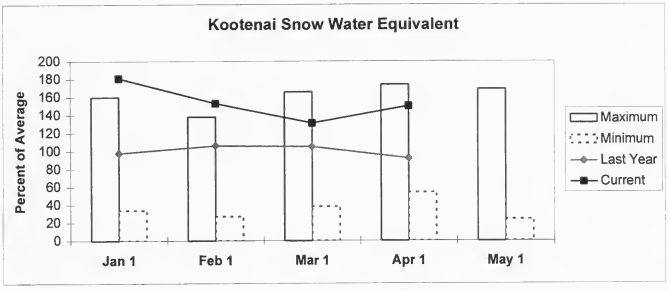
SWSI	Basin
+1.8	Kootenai River at Ft. Steele (Kootenai in Canada)
+3.6	Tobacco River
+2.9	Kootenai Ft. Steele to Libby Dam
+2.3	Kootenai River below Libby Dam
+3.8	Fisher River
+3.5	Yaak River
+3.7	North Fork Flathead River
+3.6	Middle FORK Flathead River
+3.6	South Fork Flathead River
+3.6	Flathead River at Columbia Falls
+3.7	Stillwater/Whitefish Rivers
+3.9	Swan River
+3.6	Flathead River at Polson
+3.9	Mission Valley
+3.5	Little Bitterroot River
+3.1	Clark Fork River above Rock Creek
+3.2	Blackfoot River
+3.1	Clark Fork River above Missoula
+3.8	Bitterroot River
+3.3	Clark Fork River below Bitterroot River
+3.5	Clark Fork River below Flathead River
+2.7	Beaverhead River
+3.0	Ruby River
+3.5	Big Hole River
+2.3	Boulder River (Jefferson)
+3.2	Jefferson River
+4.0	Madison River
+3.6	Gallatin River
+3.5	Missouri River above Canyon Ferry
+3.5	Missouri River below Canyon Ferry
+2.8	Smith River
+3.1	Sun River
+2.6	Teton River
+2.5	Birch/Dupuyer Creeks
+2.9	Marias River
+3.1	Musselshell River
+3.3	Missouri River above Ft. Peck
+3.3	Missouri River below Ft. Peck

Surface Water Supply Index (continued)

SWSI	Basin
+3.2	Milk River
+4.0	Yellowstone River above Livingston
+4.0	Shields River
+3.6	Boulder River (Yellowstone)
+3.2	Stillwater River
+3.7	Rock/Red Lodge Creeks
+4.0	Clarks Fork River
+3.8	Yellowstone River above Bighorn River
+3.6	Bighorn River below Bighorn Lake
+1.2	Little Bighorn River
+3.7	Yellowstone River below Bighorn River
+1.3	Tongue River
+1.8	Powder River

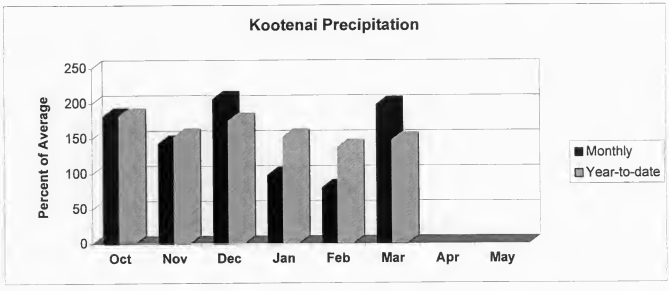
Kootenai River Basin in Montana

Snowpack conditions for the Kootenai River Basin in Montana were well above average and fourth highest of record for the period 1961-1996. Snow water content was 50 percent above average and 63 percent above last year. There were several individual snowpack data sites in the basin that have set new April 1 record highs. Snowpack conditions for the Kootenai River Basin in Canada were above average. Snow water content was 27 percent above average and 13 percent above last year.



January maximum swe was established in 1985 and minimum was in 1977; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum swe was in 1977; April maximum swe was in 1974 and minimum swe was in 1977; May maximum swe was in 1974 and minimum swe was in 1977; and June maximum swe was in 1974 and minimum swe was in 1992. Average is for the period 1961 through 1990.

Mountain precipitation during March was 98 percent above average and 306 percent above last year. Valley precipitation during March was 97 percent above average and 202 percent above last year. Mountain and valley water year precipitation, beginning October 1, 1996, was 47 percent above average and 9 percent above last year.



Lake Koocanusa storage, on the last day of March, was 54 percent above average and 38 percent above last year.

Streamflows, for the period April through July, are forecast to be 22 percent above average and 5 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +1.8 in the Kootenai River at Ft. Steele (Kootenai in Canada); +3.6 in the Tobacco River; +2.9 in the Kootenai Ft. Steele to Libby Dam; +2.3 in the Kootenai River below Libby Dam; +3.8 in the Fisher River; and +3.5 in the Yaak River.

KOOTENAI RIVER BASIN in Montana
Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
TOBACCO RIVER nr Eureka	APR-JUL	183	199	210	158	221	237	133
	APR-SEP	199	217	230	157	243	261	147
LIBBY RES Inflow (1,2)	APR-JUL	5792	6554	6900	119	7246	8008	5779
	APR-SEP	6790	7684	8090	120	8496	9390	6772
FISHER RIVER near Libby	APR-JUL	353	369	380	162	391	407	234
	APR-SEP	377	394	405	162	416	433	250
YAAK RIVER near Troy	APR-JUL	722	751	770	159	789	818	483
	APR-SEP	751	780	800	158	820	849	505
KOOTENAI at Leonia (1,2)	APR-JUL	7235	8181	8610	120	9039	9985	7199
	APR-SEP	8320	9407	9900	120	10393	11480	8275

KOOTENAI RIVER BASIN in Montana
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
LAKE KOOCANUSA	5748.0	3292.0	2386.0	2141.0

KOOTENAI RIVER BASIN in Montana
Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
KOOTENAY in CANADA	16	113	127
KOOTENAI MAINTSTEM	8	185	162
TOBACCO	3	123	142
FISHER	5	193	145
YAAK	8	146	146
KOOTENAI in MONTANA	23	163	150
abv BONNERS FERRY	39	144	143

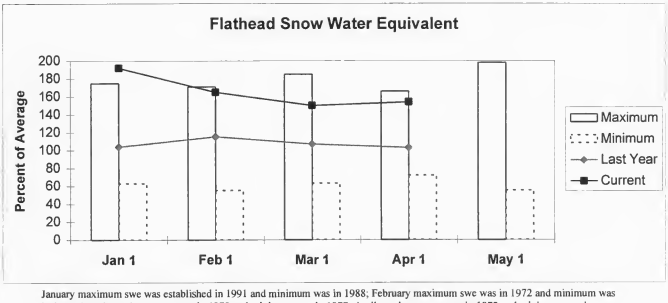
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

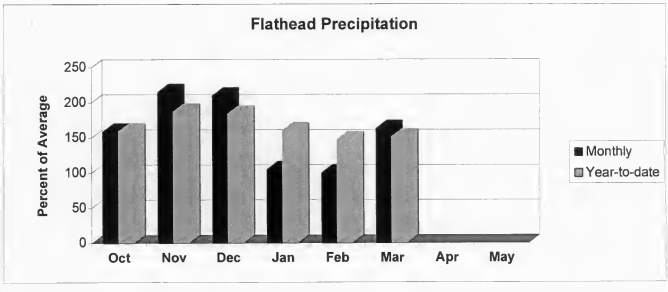
Flathead River Basin

Snowpack conditions for the Flathead River Basin in Montana were well above average and third highest of record, for the period 1961-1996. Snow water content was 54 percent above average and 50 percent above last year. There were several individual snowpack data sites in the basin that have set new April 1 record highs. Snowpack conditions for the North Fork Flathead River Basin in Canada were well above average. Snow water content was 43 percent above average and 32 percent above last year.



January maximum swe was established in 1991 and minimum was in 1988; February maximum swe was in 1972 and minimum was in 1977; March maximum swe was in 1972 and minimum was in 1977; April maximum swe was in 1972 and minimum was in 1992; May maximum swe was in 1972 and minimum was in 1992; and June maximum swe was in 1974 and minimum was in 1992. Average is for the period 1961 through 1990.

Mountain precipitation during March was 64 percent above average and 151 percent above last year. Valley precipitation during March was 48 percent above average and 39 percent above last year. Mountain and valley water year precipitation, beginning October 1, 1996, was 51 percent above average and 12 percent above last year.



Reservoir storage, on the last day of March, was 17 percent below average and 23 percent below last year. Combined Camas reservoir storage was 70 percent above average and 45 percent above last year; the combined Mission Valley reservoir storage was 18 percent below average and 20 percent below last year; Hungry Horse storage was 30 percent below average and 25 percent below last year; and Flathead Lake storage was 16 percent above average and 21 percent below last year.

Streamflows, for the period April through July, are forecast to be 42 percent above average and 25 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +3.7 in the North Fork Flathead River; +3.6 in the Middle Fork Flathead River; +3.6 in the South Fork Flathead River; +3.6 in the Flathead River at Columbia Falls; +3.7 in the Stillwater/Whitefish Rivers; +3.9 in the Swan River; +3.6 in the Flathead River at Polson; +3.9 in the Mission Valley; and +3.5 in the Little Bitterroot River.

FLATHEAD RIVER BASIN
Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter ====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
NF FLATHEAD nr Columbia Falls	APR-JUL	2117	2220	2290	138	2360	2463	1662
	APR-SEP	2334	2451	2530	138	2609	2726	1836
MF FLATHEAD nr West Glacier	APR-JUL	2087	2190	2260	138	2330	2433	1638
	APR-SEP	2273	2390	2470	138	2550	2667	1788
HUNGRY HORSE Reservoir Inflow (1,2)	APR-JUL	2659	2852	2940	143	3028	3221	2051
	APR-SEP	2823	3034	3130	143	3226	3437	2184
FLATHEAD at Columbia Falls (2)	APR-JUL	6991	7318	7540	138	7762	8089	5482
	APR-SEP	7573	7940	8190	137	8440	8807	5960
STILLWATER nr Whitefish	APR-JUL	256	282	300	159	318	344	189
	APR-SEP	277	309	330	158	351	383	209
WHITEFISH nr Kalispell	APR-JUL	135	147	155	149	163	175	104
	APR-SEP	151	165	175	151	185	199	116
SWAN RIVER near Bigfork	APR-JUL	829	871	900	154	929	971	583
	APR-SEP	930	981	1015	153	1049	1100	665
FLATHEAD Lake Inflow (1,2)	APR-JUL	8252	8925	9230	144	9535	10208	6390
	APR-SEP	8865	9646	10000	144	10354	11135	6926

FLATHEAD RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
CAMAS (4)	45.2	40.3	27.7	23.7
MISSION VALLEY (8)	100.0	33.6	41.9	40.9
HUNGRY HORSE	3451.0	1426.0	1893.0	2046.0
FLATHEAD LAKE	1791.0	870.2	1105.0	751.9

FLATHEAD RIVER BASIN
Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
NORTH FORK FLATHEAD in CA	3	132	143
NORTH FORK FLATHEAD in MO	9	134	145
MIDDLE FORK FLATHEAD	7	134	142
SOUTH FORK FLATHEAD	9	163	158
STILLWATER-WHITEFISH	10	143	148
SWAN	9	161	158
MISSION VALLEY	5	160	162
LITTLE BITTERROOT-ASHLEY	6	182	176
JOCKO	5	146	155
FLATHEAD in MONTANA	43	150	154
FLATHEAD RIVER BASIN	46	149	153

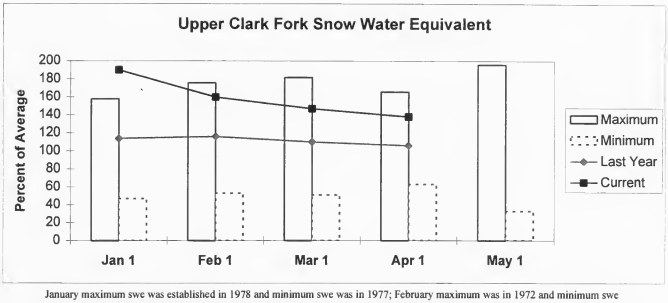
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

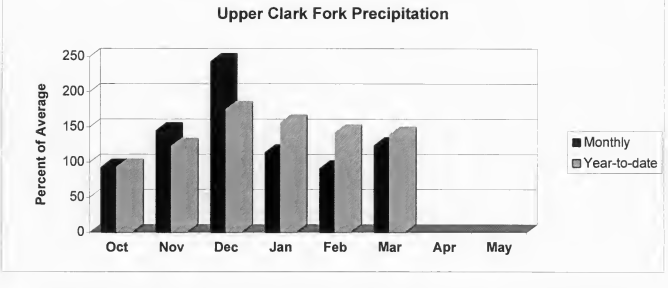
Upper Clark Fork River Basin

Snowpack conditions in the Upper Clark Fork River Basin were well above average and third highest of record, for the period 1961-1996. Snow water content was 38 percent above average and 29 percent above last year. There were several individual snowpack data sites in the basin that have set new April 1 record highs.



January maximum swe was established in 1978 and minimum swe was in 1977; February maximum was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum swe was in 1977; April maximum swe was in 1972 and minimum was in 1994; May maximum swe was in 1972 and minimum swe was in 1977; and June maximum swe was in 1975 and minimum swe was in 1987. Average is for the period 1961 through 1990.

Mountain precipitation during March was 26 percent above average and 65 percent above last year. Valley precipitation during March was 4 percent above average and 31 percent above last year. Mountain and valley water year precipitation, beginning October 1, 1996, was 39 percent above average and 9 percent above last year.



Reservoir storage, on the last day of March, was 3 percent above average and 17 percent below last year. Georgetown Lake storage was 6 percent above average and 5 percent below last year; Lower Willow Creek storage was 30 percent below average and 61 percent below last year; and Nevada Creek storage was 4 percent above average and 30 percent below last year.

Streamflows, for the period April through July, are forecast to be 50 percent above average and 62 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +3.1 in the Clark Fork River above Rock Creek; +3.2 in the Blackfoot River; and +3.1 in the Clark Fork River above Missoula.

UPPER CLARK FORK RIVER BASIN
Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ====== Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
WARM SPRINGS CK at Anaconda (2)	APR-JUL	38	45	49	129	53	60	38
	APR-SEP	48	55	60	128	65	73	47
LITTLE BLACKFOOT nr Garrison	APR-JUL	66	92	110	133	128	154	83
	APR-SEP	72	101	120	135	140	168	89
FLINT CK nr Southern Cross (2)	APR-JUL	14.1	17.6	20	141	22	26	14.2
	APR-SEP	16.6	21	24	144	27	31	16.7
FLINT CK bl Boulder Ck	APR-JUL	61	73	82	144	91	103	57
	APR-SEP	78	93	104	143	115	130	73
LOWER WILLOW CK RES Inflow	APR-JUL	14.5	17.9	20	144	23	26	14.0
	APR-SEP	15.3	18.8	21	143	24	27	14.8
MF ROCK CREEK nr Philipsburg	APR-JUL	86	94	100	152	106	114	66
	APR-SEP	94	104	110	149	116	126	74
ROCK CREEK near Clinton	APR-JUL	379	421	450	152	479	521	296
	APR-SEP	420	468	500	150	532	580	333
NEVADA CK nr Finn	APR-JUL	17.7	22	24	126	27	30	19.1
	APR-SEP	19.3	23	26	124	29	33	21
CLEARWATER nr Clearwater	APR-JUL	256	267	275	160	283	294	172
	APR-SEP	271	282	290	160	298	309	181
BLACKFOOT RIVER near Bonner	APR-JUL	1255	1329	1380	165	1431	1505	835
	APR-SEP	1393	1474	1530	165	1586	1667	926
CLARK FORK ab Milltown	APR-JUL	813	942	1030	158	1118	1247	652
	APR-SEP	937	1082	1180	156	1278	1423	755
CLARK FORK ab Missoula	APR-JUL	2079	2270	2400	161	2530	2721	1487
	APR-SEP	2356	2567	2710	161	2853	3064	1681

UPPER CLARK FORK RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
GEORGETOWN LAKE	31.0	26.3	27.8	24.8
LOWER WILLOW CREEK	4.9	1.6	4.1	2.3
NEVADA CREEK	12.6	7.6	10.8	7.3

UPPER CLARK FORK RIVER BASIN
Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
CLARK FORK above FLINT CR	16	117	128
FLINT CREEK	7	124	132
ROCK CREEK	6	125	140
CLARK FORK above BLACKFOO	25	121	133
BLACKFOOT	17	138	146
UPPER CLARK FORK RIVER BA	39	129	138

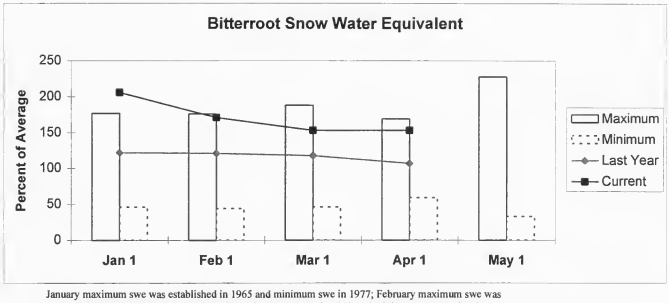
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

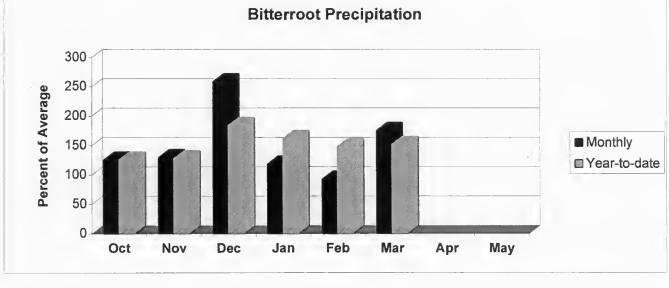
Bitterroot River Basin

Snowpack conditions in the Bitterroot River Basin were well above average and the second highest of record for the period 1961-1996. Snow water content was 53 percent above average and 44 percent above last year. There were several individual snowpack data sites in the basin that have set new April 1 record highs.



January maximum swe was established in 1965 and minimum swe in 1977; February maximum swe was in 1972 and minimum was in 1977; March maximum swe was in 1972 and minimum swe was in 1977; April maximum swe was in 1972 and minimum swe was in 1977; May maximum swe was in 1972 and minimum swe was in 1987; and June maximum swe was 1972 and 1974 and minimum swe was in 1987 and 1992. Average is for the period 1961 through 1990.

Mountain precipitation during March was 84 percent above average and 178 percent above last year. Valley precipitation during March was 10 percent below average and 26 percent above last year. Mountain and valley water year precipitation, beginning October 1, 1996, was 52 percent above average and 5 percent above last year.



Reservoir storage, on the last day of March, was 2 percent below average and 39 percent below last year. Painted Rocks Lake storage was 11 percent below average and 56 percent below last year and Como storage was 5 percent above average and 13 percent below last year.

Streamflows, for the period April through July, are forecast to be 48 percent above average and 27 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +3.8 in the Bitterroot River.

BITTERROOT RIVER BASIN

Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
WF BITTERROOT nr Conner (2)	APR-JUL	202	222	235	155	248	268	152
	APR-SEP	219	241	255	154	269	291	166
BITTERROOT nr Darby	APR-JUL	631	687	725	148	763	819	491
	APR-SEP	700	756	795	147	834	890	540
ROCK CK nr Darby (2)	APR-JUL	103	110	115	146	120	128	79
	APR-SEP	108	115	120	145	125	133	83
SKALKAHO CK nr Hamilton	APR-JUL	61	66	70	152	74	79	46
	APR-SEP	70	76	80	151	84	90	53
BURNT FORK CK nr Stevensville (2)	APR-JUL	38	42	45	155	48	53	29
	APR-SEP	43	48	52	153	56	61	34
BITTERROOT at Missoula	APR-JUL	1704	1827	1910	147	1993	2116	1301
	APR-SEP	1869	2001	2090	147	2179	2311	1418

BITTERROOT RIVER BASIN

Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
PAINTED ROCKS LAKE	31.7	12.1	27.5	13.6
COMO	34.9	16.3	18.8	15.5

BITTERROOT RIVER BASIN

Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
WEST FORK BITTERROOT	3	127	148
EAST SIDE BITTERROOT	6	127	152
WEST SIDE BITTERROOT	4	161	156
BITTERROOT RIVER BASIN	12	144	153

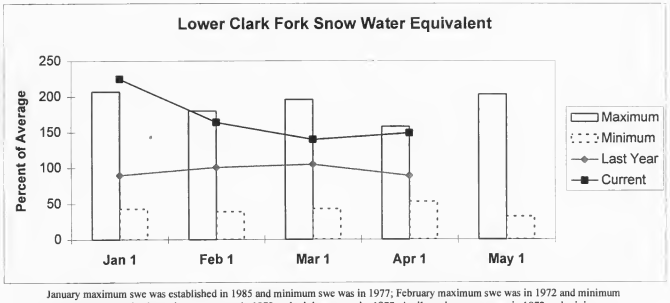
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

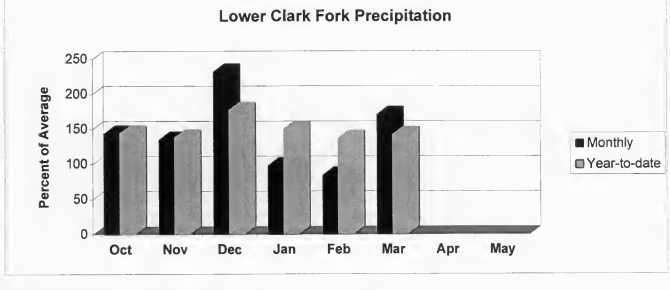
Lower Clark Fork River Basin

Snowpack conditions in the Lower Clark Fork River Basin were well above average and third highest of record, for the period 1961-1996. Snow water content was 49 percent above average and 70 percent above last year. There were several individual snowpack data sites in the basin that have set new April 1 record highs.



January maximum swe was established in 1985 and minimum swe was in 1977; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum was in 1977; April maximum swe was in 1972 and minimum swe was in 1981; May maximum swe was in 1972 and minimum swe was in 1977; and June maximum swe was in 1974 and minimum swe was in 1977. Average is for the period 1961 through 1990.

Mountain precipitation during March was 74 percent above average and 181 percent above last year. Valley precipitation during March was 57 percent above average and 132 percent above last year. Mountain and valley water year precipitation, beginning October 1, 1996, was 42 percent above average and the same as last year.



Noxon Rapids storage, on the last day of March, was 31 percent above average and 36 percent above last year.

Streamflows, for the period April through July, are forecast to be 54 percent above average and 41 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +3.3 in the Clark Fork River below Bitterroot River and +3.5 in the Clark Fork River below Flathead River.

LOWER CLARK FORK RIVER BASIN
Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<====== Drier ======		Future Conditions		====== Wetter ======>>		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
		Chance Of Exceeding *						
CLARK FORK ab Missoula	APR-JUL	2079	2270	2400	161	2530	2721	1487
	APR-SEP	2356	2567	2710	161	2853	3064	1681
CLARK FORK bl Missoula	APR-JUL	3831	4122	4320	155	4618	4809	2788
	APR-SEP	4262	4582	4800	155	5018	5338	3099
CLARK FORK at St. Regis (1)	APR-JUL	4716	5379	5680	154	5981	6644	3686
	APR-SEP	5229	5966	6300	154	6634	7371	4095
CLARK FORK nr Plains (1,2)	APR-JUL	13026	14452	15100	145	15748	17174	10450
	APR-SEP	14319	15888	16600	145	17312	18881	11470
THOMPSON RIVER nr Thompson Falls	APR-JUL	235	262	280	131	298	325	214
	APR-SEP	262	291	310	129	329	358	240
PROSPECT CREEK at Thompson Falls	APR-JUL	148	158	165	134	172	182	123
	APR-SEP	162	173	180	136	187	198	132
CLARK FK at Whitehorse Rpds (1,2)	APR-JUL	14190	15847	16600	142	17353	19010	11730
	APR-SEP	15648	17472	18300	142	19128	20952	12910

LOWER CLARK FORK RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
NOXON RAPIDS	335.0	302.0	222.2	231.3

LOWER CLARK FORK RIVER BASIN
Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
LOWER CLARK FORK	15	170	149
CLARK FORK RIVER BASIN	53	144	142
CLARK FORK ab PEND ORIELL	103	146	148
COLUMBIA IN MONTANA	114	149	149
COLUMBIA RIVER BASIN	133	144	147

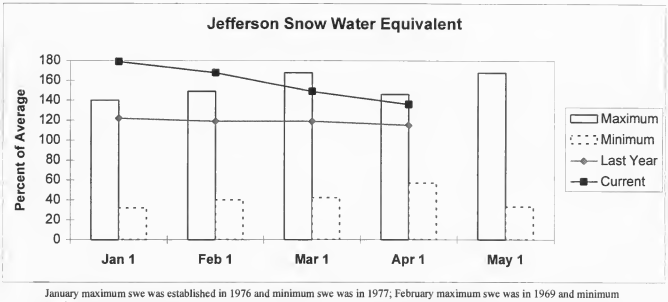
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

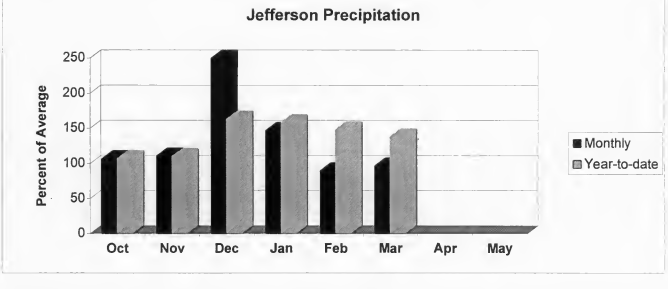
Jefferson River Basin

Snowpack conditions in the Jefferson River Basin were above average and fifth highest of record, for the period 1961-1996. Snow water content was 36 percent above average and 18 percent above last year. There were several individual snowpack data sites in the basin that have set new April 1 record highs.



January maximum swe was established in 1976 and minimum swe was in 1977; February maximum swe was in 1969 and minimum was in 1977; March maximum swe was in 1972 and minimum was in 1977; April maximum swe was in 1972 and minimum was in 1977; May maximum swe was in 1975 and minimum swe was in 1977; and June maximum swe was in 1982 and minimum in 1987. Average is for the period 1961 through 1990.

Mountain precipitation during March was 2 percent below average and 14 percent above last year. Valley precipitation during March was 28 percent below average and 49 percent below last year. Mountain and valley water year precipitation, beginning October 1, 1996, was 38 percent above average and 14 percent above last year.



Reservoir storage, on the last day of March, was 5 percent above average and 5 percent below last year. Lima storage was 47 percent above average and 6 percent below last year; Clark Canyon storage was 2 percent below average and 4 percent below last year; and Ruby River storage was 6 percent below average and 8 percent below last year.

Streamflows, for the period April through July, are forecast to be 56 percent above average and 32 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +3.2 in the Jefferson River; +2.7 in the Beaverhead River; +3.0 in the Ruby River; +3.5 in the Big Hole River; and +2.3 in the Boulder River.

JEFFERSON RIVER BASIN
Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
RED ROCK RIVER near Monida (2)	APR-JUL	122	133	140	144	147	158	97
	APR-SEP	129	143	152	145	161	175	105
BEAVERHEAD RIVER near Grant (2)	APR-JUL	148	170	185	140	200	222	132
	APR-SEP	149	188	215	139	242	281	155
BEAVERHEAD RIVER at Barretts (2)	APR-JUL	192	212	225	131	238	258	172
	APR-SEP	228	250	265	131	280	302	203
RUBY RIVER near Alder	APR-JUL	72	89	100	121	112	128	83
	APR-SEP	87	107	120	121	134	153	99
BIG HOLE RIVER near Melrose	APR-JUL	827	930	1000	156	1070	1173	641
	APR-SEP	901	1011	1085	156	1159	1269	697
BOULDER RIVER near Boulder	APR-JUL	105	120	130	153	140	155	85
	APR-SEP	115	130	140	154	150	166	91
WILLOW CREEK near Harrison	APR-JUL	19.9	25	28	157	31	36	17.7
	APR-SEP	22	27	31	155	35	40	20
JEFFERSON RIVER near Three Forks (2)	APR-JUL	1282	1442	1550	157	1658	1818	985
	APR-SEP	1417	1586	1700	157	1814	1983	1080

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

JEFFERSON RIVER BASIN
Reservoir Storage (1000 AF) - End of March

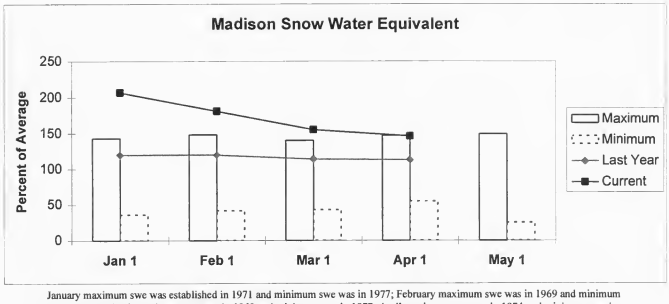
Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
LIMA	84.0	54.2	57.8	36.9
CLARK CANYON	255.6	150.0	156.7	153.6
RUBY RIVER	38.8	29.4	31.9	31.2

JEFFERSON RIVER BASIN
Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
BEAVERHEAD	17	119	134
RUBY	10	118	125
BIGHOLE	21	115	142
BOULDER	9	123	130
JEFFERSON RIVER BASIN	47	118	136

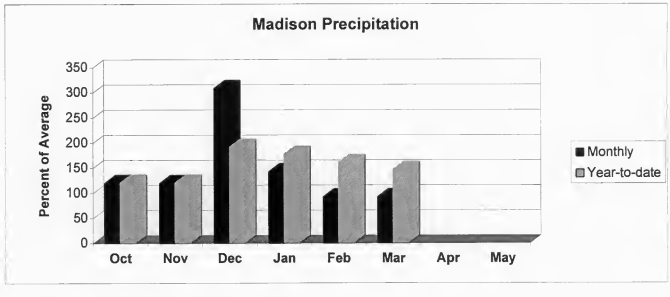
Madison River Basin

Snowpack conditions in the Madison River Basin were well above average and tied with the record high, for the period 1961-1996. Snow water content was 46 percent above average and 29 percent above last year. There were several individual snowpack data sites in the basin that have set new April 1 record highs.



January maximum swe was established in 1971 and minimum swe was in 1977; February maximum swe was in 1969 and minimum was in 1977; March maximum swe was in 1969 and minimum was in 1977; April maximum swe was in 1974 and minimum was in 1977; May maximum swe was in 1971 and minimum swe was in 1977; and June maximum swe was in 1995 and minimum in 1987. Average is for the period 1961 through 1990.

Mountain and valley precipitation during March was 6 percent below average and 2 percent below last year. Mountain and valley water year precipitation, beginning October 1, 1996, was 47 percent above average and 28 percent above last year.



Reservoir storage, on the last day of March, was 6 percent below average and 8 percent below last year. Ennis Lake storage was 15 percent below average and 5 percent below last year and Hebgen Lake storage was 5 percent below average and 8 percent below last year. Keep in mind, reservoirs are being managed in anticipation of the high spring runoff from well above average snowpack. Questions concerning reservoir operations should be directed to the reservoir owners.

Streamflows, for the period April through July, are forecast to be 46 percent above average and 29 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +4.0 in the Madison River.

MADISON RIVER BASIN

Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<======= Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
MADISON RIVER near Grayling (2)	APR-JUL	487	518	540	142	562	593	380
	APR-SEP	626	664	690	142	716	754	486
MADISON RIVER near McAllister (2)	APR-JUL	896	946	980	148	1014	1064	662
	APR-SEP	1123	1178	1215	146	1252	1307	831

MADISON RIVER BASIN

Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
ENNIS LAKE	41.0	28.2	29.6	33.2
HEBGEN LAKE	377.5	234.4	255.8	246.6

MADISON RIVER BASIN

Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
MADISON above HEBGEN LAKE	6	134	162
MADISON below HEBGEN LAKE	11	124	135
MADISON RIVER BASIN	17	129	146

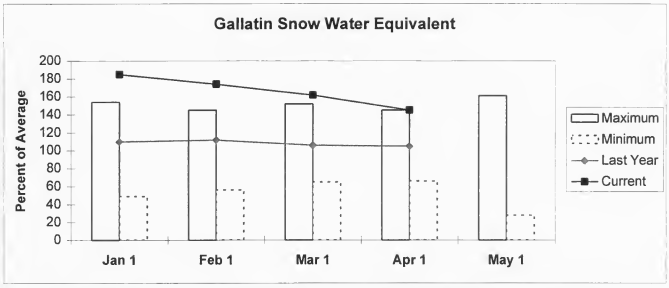
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

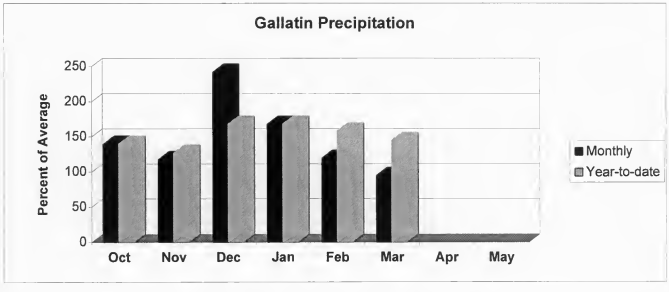
Gallatin River Basin

Snowpack conditions in the Gallatin River Basin were well above average and tied with the record high, for the period 1961-1996. Snow water content was 45 percent above average and 37 percent above last year. There were several individual snowpack data sites in the basin that have set new April 1 record highs.



January maximum swe was established in 1968 and minimum swe was in 1966; February maximum swe was in 1965 and minimum was in 1981; March maximum swe was in 1965 and minimum was in 1977 and 1987; April maximum swe was in 1971 and minimum was in 1987; May maximum swe was in 1970 and minimum swe was in 1987; and June maximum swe was in 1975 and minimum in 1987. Average is for the period 1961 through 1990.

Mountain precipitation during March was 5 percent below average and 12 percent above last year. Valley precipitation during March was 3 percent below average and 126 percent above last year. Mountain and valley water year precipitation, beginning October 1, 1996, was 45 percent above average and 29 percent above last year.



Middle Creek storage, on the last day of March, was 76 percent above average and 20 percent above last year. Keep in mind, reservoirs are being managed in anticipation of the high spring runoff from well above average snowpack. Questions concerning reservoir operations should be directed to the reservoir owners.

Streamflows, for the period April through July, are forecast to be 49 percent above average and 37 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +3.6 in the Gallatin River.

GALLATIN RIVER BASIN

Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
GALLATIN RIVER near Gateway	APR-JUL	569	608	635	144	662	701	441
	APR-SEP	669	711	740	143	769	811	518
E & W FK HYALITE CREEK near Bozeman	APR-JUL	26	29	31	135	33	36	23
	APR-SEP	30	33	35	135	37	40	26
HYALITE CREEK near Bozeman (2)	APR-JUL	42	47	50	139	53	59	36
	APR-SEP	49	54	58	138	62	67	42
GALLATIN RIVER at Logan (2)	APR-JUL	633	714	770	155	826	907	498
	APR-SEP	757	842	900	155	958	1043	581

GALLATIN RIVER BASIN

Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
MIDDLE CREEK	10.2	7.2	6.0	4.1

GALLATIN RIVER BASIN

Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
UPPER GALLATIN	7	124	143
HYALITE	4	143	132
BRIDGER	4	160	159
GALLATIN RIVER BASIN	15	137	145
MISSOURI HEADWATERS	72	125	140

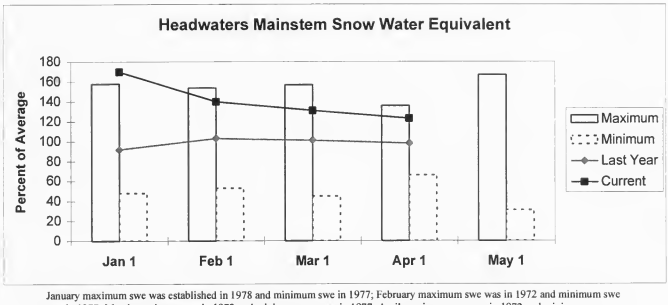
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

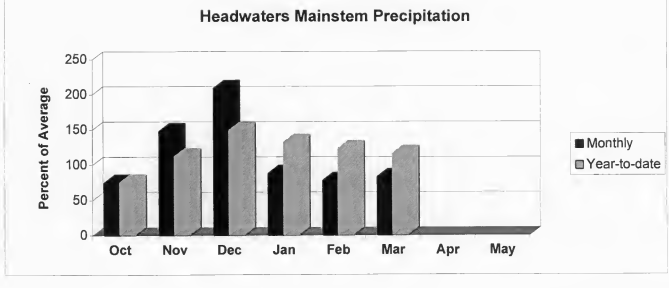
Missouri Mainstem River Basin

Snowpack conditions in the Mainstem Missouri River Basin were above average. Snow water content was in the Headwaters Missouri Mainstem was 23 percent above average, 21 percent above last year, and second highest of record for the period 1961-1996; the Smith-Judith-Musselshell was 26 percent above average, 34 percent above last year, and third highest of record for the period 1961-1996; and the Sun-Teton-Marias was 35 percent above average, 31 percent above last year, and fifth highest of record for the period 1961-1996. There were several individual snowpack data sites in the basin that have set new April 1 record highs.



January maximum swe was established in 1978 and minimum swe in 1977; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe in 1972 and minimum swe was in 1977; April maximum swe was in 1972 and minimum swe was in 1961; May maximum swe was in 1975 and minimum swe was in 1977; and June maximum swe was in 1982 and minimum swe was in 1992. Average is for the period 1961 through 1990.

Mountain precipitation during March was 6 percent below average and 17 percent above last year. Valley precipitation during March was 23 percent below average and 30 percent below last year. Mountain and valley water year precipitation, beginning October 1, 1996, was 16 percent above average and 8 percent above last year.



Reservoir storage, on the last day of March, was 17 percent below average and 13 percent below last year. Canyon Ferry Lake storage was 20 percent below average and 15 percent below last year; Helena Valley storage was 40 percent above average and the same as last year; Lake Helena storage was 7 percent above average and 2 percent below last year; Hauser & Helena storage was 3 percent above average and the same as last year; Holter Lake storage was 20 percent above average and 1 percent below last year; and Fort Peck Lake storage was 5 percent above average and 5 percent below last year. Keep in mind, reservoirs are being managed in anticipation of the high spring runoff from well above average snowpack. Questions concerning reservoir operations should be directed to the reservoir owners.

Streamflows, for the period April through July, are forecast to be 59 percent above average and 35 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +3.5 in the Missouri River above Canyon Ferry; +3.5 in the Missouri River below Canyon Ferry; +3.3 in the Missouri River above Ft. Peck; and +3.3 in the Missouri River below Ft. Peck.

MISSOURI MAINSTEM RIVER BASIN
Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter ====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
MISSOURI RIVER at Toston (2)	APR-JUL	2504	2919	3200	154	3481	3896	2075
	APR-SEP	2972	3406	3700	153	3994	4428	2416
PRICKLY PEAR CREEK near Clancy	APR-JUL	11.1	20	27	115	33	42	23
	APR-SEP	13.6	24	31	115	38	48	27
SUN RIVER at Gibson Dam (2)	APR-JUL	498	574	625	131	676	752	478
	APR-SEP	551	631	685	130	739	819	526
MISSOURI RIVER at Fort Benton (2)	APR-JUL	3571	4279	4760	154	5241	5949	3087
	APR-SEP	4708	5174	5700	155	6226	6694	3678
MARIAS RIVER near Shelby (2)	APR-JUL	499	586	645	144	704	791	447
	APR-SEP	526	615	675	139	735	824	487
MISSOURI RIVER at Virgelle (2)	APR-JUL	4257	5042	5575	155	6108	6893	3595
	APR-SEP	5356	5903	6500	154	7097	7844	4217
MISSOURI RIVER near Landusky (2)	APR-JUL	4695	5502	6050	155	6598	7405	3897
	APR-SEP	5817	6512	7100	155	7688	8610	4580
MISSOURI RIVER below Fort Peck (2)	APR-JUL	4952	5731	6260	156	6789	7568	4015
	APR-SEP	5837	6578	7150	156	7722	8732	4596
LAKE SAKAKAWEA Inflow (2)	APR-JUL	13833	15004	15800	160	16596	17767	9897
	APR-SEP	15090	17037	18000	159	18963	21217	11346

MISSOURI MAINSTEM RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
CANYON FERRY LAKE	2043.0	1195.0	1401.0	1489.0
HELENA VALLEY	9.2	5.6	5.6	4.0
LAKE HELENA	10.4	10.9	11.1	10.2
HAUSER & HELENA	61.9	63.1	63.2	61.0
HOLTER LAKE	81.9	80.7	81.2	67.2
FORT PECK LAKE (MAF)	18.9	15.7	16.6	14.9

MISSOURI MAINSTEM RIVER BASIN
Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
MISSOURI MAINSTEM	10	121	123
SMITH-JUDITH-MUSSELSHELL	17	134	126
SUN-TETON-MARIAS	14	131	135
MISSOURI abv FT PECK	40	131	129
MILK RIVER BASIN	6	93	57
MISSOURI MAINSTEM BASIN	45	129	125

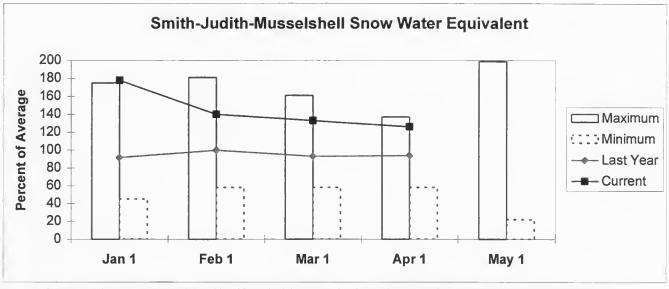
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

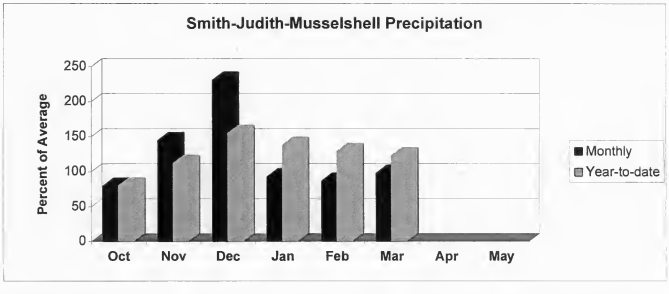
Smith-Judith-Musselshell River Basins

Snowpack conditions in the Smith-Judith-Musselshell River Basins were above average and third highest of record, for the period 1961-1996. Snow water content in the Smith River Basin was 31 percent above average and 28 percent above last year; the Judith River Basin was 13 percent above average and 25 percent above last year; and the Musselshell River Basin was 35 percent above average and 45 percent above last year.



January maximum swe was established in 1978 and minimum swe in 1988; February maximum swe was in 1978 and minimum swe was in 1987; March maximum swe was in 1978 and minimum swe was in 1987; April maximum swe was in 1970 and minimum swe was in 1992; and May maximum swe was in 1970 and minimum swe was in 1987; and June maximum swe was in 1982 and minimum swe was in 1992. Average is for the period 1961 through 1990.

Mountain and valley precipitation for the combined basins was 2 percent below average and 11 percent below last year and the water year precipitation was 23 percent above average and 10 percent above last year. Smith River mountain and valley precipitation during March was 3 percent above average and 4 percent above last year and water year precipitation was 35 percent above average and 12 percent above last year; Judith River mountain and valley precipitation during March was at average and 19 percent below last year and water year precipitation was 14 percent above average and 9 percent above last year; and the Musselshell River mountain and valley March precipitation was 15 percent below average and 10 percent below last year and the water year precipitation was 41 percent above average and 17 percent above last year.



Reservoir storage, on the last day of March, was 7 percent above average and 22 percent below last year. Smith River storage was 5 percent below average and 19 percent below last year; Newlan Creek storage was 2 percent below average and 14 percent below last year; Bair storage was 32 percent below average and 40 percent below last year; Martinsdale storage was 12 percent above average and 27 percent below last year; and Deadman's Basin was 12 percent above average and 21 percent below last year.

Streamflows, for the period April through July, are forecast to be 33 percent above average and 27 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +2.8 in the Smith River and +3.1 in the Musselshell River.

SMITH-JUDITH-MUSSELSHELL RIVER BASINS
Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<======= Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
SHEEP CREEK nr White Sulphur Springs	APR-JUL	21	23	25	138	27	29	18.1
	APR-SEP	24	27	29	138	31	34	21
SMITH RIVER blw Eagle Creek	APR-JUL	109	128	140	136	152	171	103
	APR-SEP	131	154	170	137	186	209	124
NF MUSSELSHELL near Delpine	APR-JUL	3.84	5.13	6.00	125	6.87	8.16	4.80
	APR-SEP	4.58	6.02	7.00	125	7.98	9.42	5.60
SF MUSSELSHELL abv Martinsdale	APR-JUL	36	53	65	125	77	94	52
	APR-SEP	40	58	70	125	82	101	56

SMITH-JUDITH-MUSSELSHELL RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
SMITH RIVER	10.6	7.0	8.6	7.4
NEWLAN CREEK	12.4	8.1	9.4	8.3
BAIR	7.0	3.2	5.3	4.7
MARTINSDALE	23.1	10.9	15.0	9.7
DEADMAN'S BASIN	72.2	56.3	71.2	50.1

SMITH-JUDITH-MUSSELSHELL RIVER BASINS
Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
SMITH	7	128	131
JUDITH	9	125	113
MUSSELSHELL	9	145	135
SMITH-JUDITH-MUSSELSHELL	17	134	126

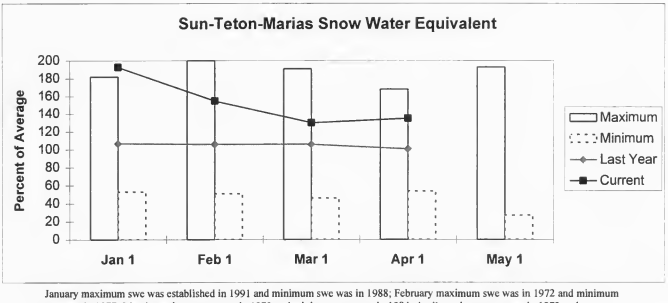
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

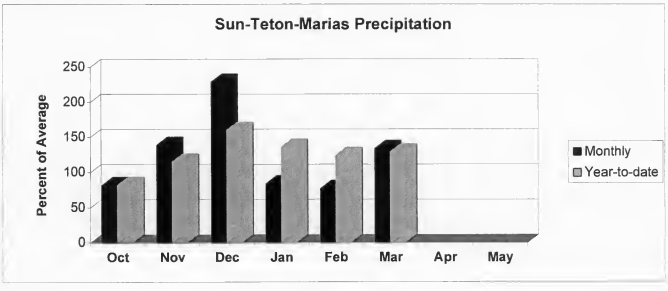
Sun-Teton-Marias River Basins

Snowpack conditions in the Sun-Teton-Marias River Basins were well above average and fifth highest of record, for the period 1961-1996. Snow water content in the Sun River Basin was 32 percent above average and 27 percent above last year; the Teton River Basin was 28 percent above average and 12 percent above last year; and the Marias River Basin was 33 percent above average and 32 percent above last year.



January maximum swe was established in 1991 and minimum swe was in 1988; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum swe was in 1984; April maximum swe was in 1972 and minimum swe was in 1984; May maximum swe was in 1972 and minimum swe was in 1977; and June maximum was in 1982 and minimum swe was in 1992. Average is for the period 1961 through 1990.

Combined mountain and valley precipitation for the three basins during March was 34 percent above average and 30 percent above last year with the water year precipitation, beginning October 1, 1996, 29 percent above average and 2 percent below last year. Mountain and valley precipitation in the Sun River was 15 percent above average and 4 percent above last year with the water year precipitation 17 percent above average and 11 percent below last year; in the Teton River was 45 percent above average and 25 percent above last year with the water year precipitation 21 percent above average and 17 percent below last year; and in the Marias River was 34 percent above average and 41 percent above last year with the water year precipitation 35 percent above average and 7 percent above last year.



Reservoir storage, on the last day of March, was 42 percent above average and 28 percent above last year. Gibson storage was 21 percent above average and 129 percent above last year; Pishkun storage was 107 percent above average and 145 percent above last year; Willow Creek storage was 21 percent above average and 39 percent above last year; Lower Two Medicine Lake storage was 40 percent above average and 10 percent below last year; Four Horns Lake storage was 42 percent below average and 35 percent below last year; Swift storage was 47 percent above average and 39 percent above last year; Lake Frances storage was 34 percent above average and 84 percent above last year; and Lake Elwell (Tiber) storage was 46 percent above average and 19 percent above last year.

Streamflows, for the period April through July, are forecast to be 38 percent above average and 24 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +3.1 the Sun River; +2.6 in the Teton River; +2.9 in the Marias River; and +2.5 in the Birch/Dupuyer Creeks.

SUN-TETON-MARIAS RIVER BASINS
Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter ====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
SUN RIVER at Gibson Dam (2)	APR-JUL	498	574	625	131	676	752	478
	APR-SEP	551	631	685	130	739	819	526
TWO MEDICINE RIVER near Browning (2)	APR-JUL	246	287	315	147	343	384	215
	APR-SEP	262	302	330	145	358	398	228
BADGER CREEK near Browning (2)	APR-JUL	108	127	140	135	153	172	104
	APR-SEP	125	146	160	133	174	195	120
SWIFT RESERVOIR Inflow near Dupuyer	APR-JUL	67	81	90	132	100	114	68
	APR-SEP	81	95	105	131	115	130	80
DUPUYER CREEK near Valier	APR-JUL	9.3	18.3	25	158	31	40	15.5
	APR-SEP	11.5	21	28	161	35	45	17.4
CUT BANK CREEK at Cut Bank	APR-JUL	97	111	120	138	129	143	87
	APR-SEP	106	120	130	135	140	154	96
MARIAS RIVER near Shelby (2)	APR-JUL	499	586	645	144	704	791	447
	APR-SEP	526	615	675	139	735	824	487

SUN-TETON-MARIAS RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
GIBSON	99.1	45.7	61.0	50.5
PISHKUN	32.0	35.3	36.8	17.8
WILLOW CREEK	32.2	9.9	27.6	22.8
LOWER TWO MEDICINE LAKE	11.9	4.0	10.5	7.5
FOUR HORNS LAKE	19.2	12.3	7.3	12.5
SWIFT	30.0	13.3	25.3	17.2
LAKE FRANCES	112.0	77.3	96.0	71.6
LAKE ELWELL (TIBER)	1347.0	804.0	869.9	596.7

SUN-TETON-MARIAS RIVER BASINS
Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
SUN	7	130	136
TETON	4	112	128
MARIAS	6	132	133
SUN-TETON-MARIAS	14	131	135

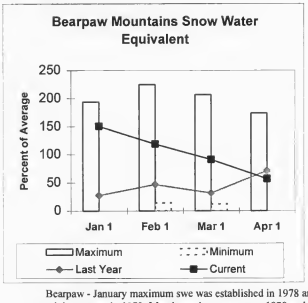
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

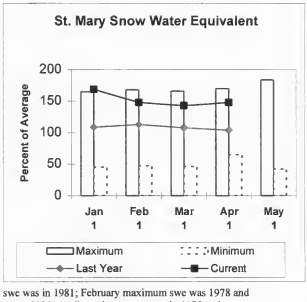
The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

St. Mary and Milk River Basins

Snowpack conditions in the St. Mary River and Milk River Basins were above average. Snow water content in the St. Mary River Basin was 48 percent above average, 42 percent above last year and fourth highest of record, for the period 1961-1996. The Bearpaw Mountains were 43 percent below average and 7 percent below last year.

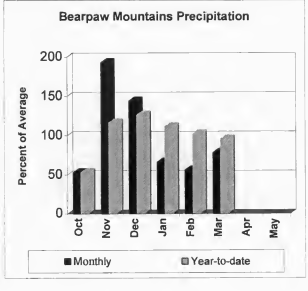


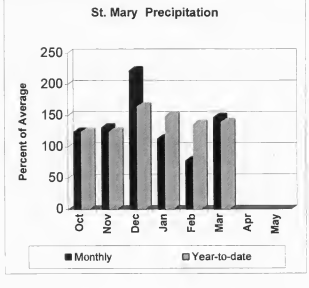


Bearpaw - January maximum swe was established in 1978 and minimum swe was in 1981; February maximum swe was 1978 and minimum was in 1973; March maximum swe was 1978 and minimum swe was 1981; April maximum swe was in 1975 and minimum swe was in 1983; May maximum swe wa 1975 and the minimum has ocurred in several years. Average is for the period 1961 through 1990.

St. Mary - January maximum swe was established in 1991 and minimum swe was in 1988; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum swe was in 1977; April maximum swe was in 1972 and minimum swe was in 1992; May maximum swe was in 19972 and minimum swe was in 1977; and June maximum swe was in 1991 and minimum swe was 1992. Average is for the period 1961 through 1990.

Combined Mountain and valley precipitation during March was 18 percent above average and 21 percent above last year with the water year precipitation, beginning October 1, 1996, 24 percent above average and 1 percent below last year. Mountain and Valley precipitation in the St. Mary River was 47 percent above average and 168 percent above last year with the water year precipitation, beginning October 1, 1996, 39 percent above average and 4 percent above last year. The Milk River was 22 percent below average and 51 percent below last year with the water year precipitation, beginning October 1, 1996, 5 percent below average and 36 percent below last year.





Reservoir storage, on the last day of March, was 29 percent above average and 2 percent above last year. Lake Sherburne storage was 39 percent above average and 12 percent below last year; Fresno storage was 41 percent above average and 5 percent above last year; Beaver Creek storage was 59 percent above average and 25 percent above last year; and Nelson storage was 4 percent below average and 8 percent above last year.

Streamflows in the St. Mary, for the period April through July, are forecast to be 28 percent above average and 20 percent above last years forecasts. Streamflow in the Milk, for the period April through July, are forecast to be 33 percent above average and 29 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +3.2 in the Milk River.

ST. MARY and MILK RIVER BASINS
Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ====== Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
SWIFTCURRENT CREEK at Sherburne (2)	APR-JUL	121	129	135	126	141	149	107
	APR-SEP	139	149	155	124	161	171	125
ST. MARY RIVER near Babb	APR-JUL	465	495	515	130	535	565	395
	APR-SEP	542	578	603	130	628	664	463
ST. MARY RIVER at US/CAN Border (2)	APR-JUL	514	558	588	127	618	662	462
	APR-SEP	600	649	683	127	717	766	539
MILK RIVER at Western Crossing	APR-JUL	39	47	52	141	57	65	37
	APR-SEP	42	50	55	141	60	68	39
MILK RIVER at Eastern Crossing (2)	APR-JUL	53	69	80	138	91	107	58
	APR-SEP	67	82	92	137	102	117	67
BEAVER CREEK near Havre	APR-JUL	-0.09	4.01	6.80	72	9.59	13.69	9.50

ST. MARY and MILK RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
LAKE SHERBURNE	64.3	34.5	39.1	24.8
FRESNO	127.0	108.6	103.6	77.1
BEAVER CREEK	3.5	3.5	2.8	2.2
NELSON	66.8	34.9	32.2	36.5

ST. MARY and MILK RIVER BASINS
Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
ST. MARY	3	142	148
BEARPAW MOUNTAINS	6	93	57
CYPRESS HILLS, CANADA	0	0	0
MILK RIVER BASIN	6	93	57
ST. MARY & MILK BASINS	9	136	129

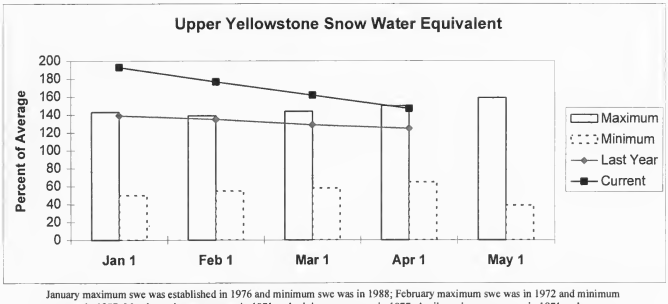
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

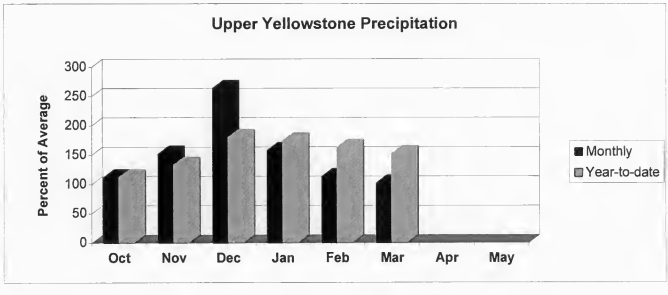
Upper Yellowstone River Basin

Snowpack conditions in the Upper Yellowstone River Basin were well above average and tied with the record high, for the period 1961-1996. Snow water content was 47 percent above average and 17 percent above last year. There were several individual snowpack data sites in the basin that have set new April 1 record highs.



January maximum swe was established in 1976 and minimum swe was in 1988; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe was in 1971 and minimum swe was in 1977; April maximum swe was in 1971 and minimum swe was in 1981; May maximum swe was in 1971 and minimum swe was in 1987; and June maximum swe was 1982 and minimum swe was in 1987 and 1994. Average is for the period 1961 through 1990.

Mountain precipitation during March was 4 percent above average and 10 percent below last year. Valley precipitation during March was 42 percent below average and 58 percent below last year. Water year precipitation, beginning October 1, 1996, was 52 percent above average and 16 percent above last year.



Reservoir storage, on the last day of March, was 2 percent below average and 1 percent below last year. Mystic Lake storage was 90 percent below average and 25 percent below last year and Cooney storage was 14 percent above average and the same as last year. Keep in mind, reservoirs are being managed in anticipation of the high spring runoff from well above average snowpack. Questions concerning reservoir operations should be directed to the reservoir owners.

Streamflows, for the period April through July, are forecast to be 53 percent above average and 25 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +3.8 in the Yellowstone River above Bighorn River; +4.0 in the Yellowstone River above Livingston; +4.0 in the Shields River; +3.6 in the Boulder River; +3.2 in the Stillwater River; +3.7 in the Rock/Red Lodge Creeks; and +4.0 in the Clarks Fork River.

UPPER YELLOWSTONE RIVER BASIN
Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
YELLOWSTONE at Lake Outlet	APR-JUL	740	797	835	146	873	930	573
	APR-SEP	1026	1100	1150	145	1200	1274	792
YELLOWSTONE RIVER at Corwin Springs	APR-JUL	2341	2436	2500	155	2564	2659	1609
	APR-SEP	2786	2913	3000	155	3087	3214	1937
YELLOWSTONE RIVER near Livingston	APR-JUL	2701	2819	2900	156	2981	3099	1855
	APR-SEP	3256	3401	3500	156	3599	3744	2241
SHIELDS RIVER near Livingston	APR-JUL	229	253	270	167	287	311	162
	APR-SEP	253	278	295	165	312	337	179
BOULDER RIVER at Big Timber	APR-JUL	431	472	500	149	528	569	335
	APR-SEP	480	522	550	151	578	620	364
WEST ROSEBUD CREEK near Roscoe (2)	APR-JUL	80	86	90	148	94	100	61
	APR-SEP	103	110	115	146	120	127	79
STILLWATER RIVER nr Absarokee (2)	APR-JUL	591	659	705	142	751	819	498
	APR-SEP	706	771	815	137	859	924	593
CLARKS FORK RIVER near Belfry	APR-JUL	670	724	760	143	796	850	532
	APR-SEP	740	799	840	142	881	940	590
RED LODGE CREEK blw Cooney Res (2)	APR-JUL	44	59	70	149	81	96	47
	APR-SEP	57	73	83	146	94	109	57
YELLOWSTONE RIVER at Billings (2)	APR-JUL	4801	5244	5545	155	5846	6289	3577
	APR-SEP	5938	6174	6500	154	6826	7074	4211

UPPER YELLOWSTONE RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
MYSTIC LAKE	21.0	0.3	0.4	3.1
COONEY	27.4	19.2	19.2	16.9

UPPER YELLOWSTONE RIVER BASIN
Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
YELLOWSTONE above LIVINGS	17	115	153
SHIELDS	8	156	160
BOULDER-STILLWATER	7	110	130
CLARK'S FORK-ROCK CREEK	13	103	141
UPPER YELLOWSTONE RIVER B	41	117	147

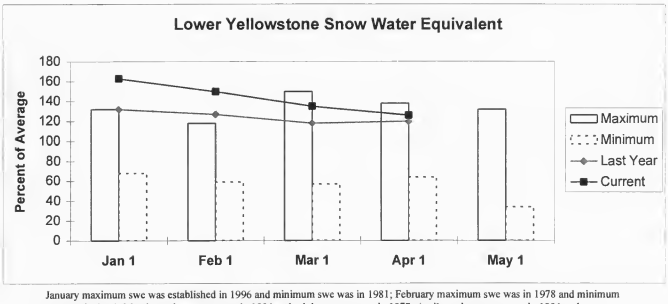
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

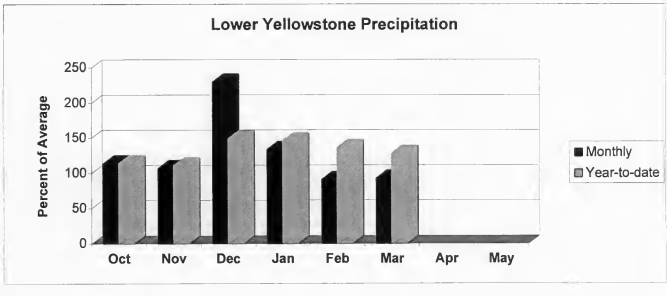
Lower Yellowstone River Basin

Snowpack conditions in the Lower Yellowstone River Basin were well above average and second highest of record, for the period 1961-1996. Snow water content was 26 percent above average and 5 percent above last year. Several data sites in the basin headwaters have set or are near record high snowpack.



January maximum swe was established in 1996 and minimum swe was in 1981; February maximum swe was in 1978 and minimum swe was in 1981; March maximum swe was in 1986 and minimum swe was in 1977; April maximum swe was in 1986 and minimum swe was in 1981; May maximum swe was in 1986 and minimum swe was in 1981; and June maximum swe was in 1995 and minimum swe was in 1994. Average is for the period 1961 through 1990.

Mountain and valley precipitation during March was 7 percent below average and 26 percent below last year. Water year precipitation, beginning October 1, 1996, was 28 percent above average and 4 percent above last year.



Reservoir storage, on the last day of March, was 6 percent below average and 4 percent below last year. Bighorn Lake storage was 5 percent below average and 3 percent below last year and Tongue River was 29 percent below average and 36 percent below last year. Keep in mind, reservoirs are being managed in anticipation of the high spring runoff from well above average snowpack. Questions concerning reservoir operations should be directed to the reservoir owners.

Streamflows, for the period April through July, are forecast to be 58 percent above average and 20 percent above last years forecasts.

Surface Water Supply Index (SWSI) was +3.7 in the Yellowstone River below Bighorn River; +3.6 in the Bighorn River below Bighorn Lake; +1.2 in the Little Bighorn River; +1.3 in the Tongue River; and +1.8 in the Powder River.

LOWER YELLOWSTONE RIVER BASIN
Streamflow Forecasts - April 1, 1997

Forecast Point	Forecast Period	<<<<<<< Drier ====== Future Conditions ======= Wetter =======>>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
YELLOWSTONE RIVER at Billings (2)	APR-JUL	4801	5244	5545	155	5846	6289	3577
	APR-SEP	5938	6174	6500	154	6826	7074	4211
BIGHORN RIVER nr St. Xavier (2)	APR-JUL	2258	2521	2700	164	2879	3142	1645
	APR-SEP	2371	2716	2900	160	3084	3457	1810
LITTLE BIGHORN RIVER nr Hardin	APR-JUL	93	133	160	114	187	227	140
	APR-SEP	94	144	175	112	206	278	156
TONGUE RIVER stateline nr Decker (2)	APR-JUL	196	240	270	117	300	344	230
	APR-SEP	180	264	295	118	326	378	250
YELLOWSTONE RIVER at Miles City (2)	APR-JUL	7335	8148	8700	160	9252	10065	5431
	APR-SEP	8668	9417	10000	159	10583	11306	6281
POWDER RIVER at Moorhead	APR-JUL	128	177	210	100	243	292	211
	APR-SEP	157	202	232	100	262	307	232
POWDER RIVER near Locate	APR-JUL	159	213	250	99	287	341	252
	APR-SEP	99	232	275	100	318	454	275
YELLOWSTONE RIVER nr Sidney (2)	APR-JUL	7708	8805	9550	161	10295	11392	5925
	APR-SEP	8958	9652	10500	161	11348	12032	6539

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

LOWER YELLOWSTONE RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
BIGHORN LAKE	1356.0	761.0	783.3	798.5
TONGUE RIVER	68.0	25.5	40.0	36.1

LOWER YELLOWSTONE RIVER BASIN
Watershed Snowpack Analysis - April 1, 1997

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
WIND RIVER (Wyoming)	20	109	133
SHOSHONE RIVER (Wyoming)	6	101	152
BIGHORN RIVER (Wyoming)	20	104	131
LITTLE BIGHORN (WYOMING)	3	103	109
TONGUE RIVER (Wyoming)	9	99	112
POWDER RIVER (Wyoming)	9	108	116
LOWER YELLOWSTONE RIVER B	48	105	126
YELLOWSTONE RIVER BASIN	85	112	136
MISSOURI+YELLOWSTONE	189	119	135
MONTANA	244	137	144

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Montana
Basin Outlook Report

Natural Resources Conservation Service
Bozeman, MT